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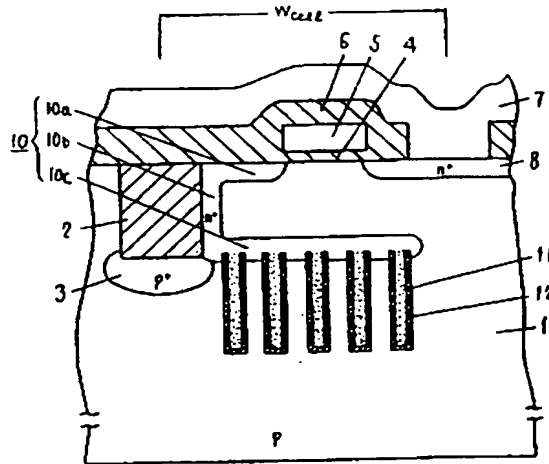
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TITLE : SEMICONDUCTOR DEVICE



ABSTRACT : PURPOSE: To obtain a high storage capacitance value, by embedding circular-cylinder shaped electrodes having minute diameters and many cylindrical dielectric thin film covering said electrodes in a semiconductor substrate, using these as storage capacitors, and forming a switching transistor on the upper surfaces thereof.

CONSTITUTION: In the vicinity of the surface of a P-type silicon substrate 1, the following parts are formed: a storing node 10a; an n⁺ impurity region 10b along an isolating region 2; an n⁺ impurity region 10c in the substrate; a circular column-shaped storage capacitor electrodes 11, which are n⁺ region and connected to the region 10c; and cylindrical dielectric thin films 12 covering the side surfaces of the electrodes. The n⁺ region 10c connects the circular column-shaped storage capacitor electrodes 11 in the lateral direction; and connected to the storing node 10a through the n⁺ region 10b. A positive potential is applied to a gate 5 as a word line. A part between an aluminum 7 as a bit line and the storage capacitor electrodes 11 is conducted, and signals are written and read out. The capacitor electrode has the total area of the surface areas of the minute circular column-shaped n⁺ regions. Therefore, the more the minute electrodes are formed, the more the value of the storage capacitance is increased. Present invention can be used for highly integrated, high-capacity memory of 64 M or more.

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